



RAW SEQUENCE LISTING DATE: 12/07/2001 PATENT APPLICATION: US/09/997,664 TIME: 13:03:07

Input Set : A:\BC1018 US CIP Seq Listing.txt
Output Set: N:\CRF3\12072001\I997664.raw



```
3 <110> APPLICANT: Ben-Bassat, Arie
              Cattermole, Monica
      4
      5
              Gatenby, Anthony A.
      6
              Gibson, Katherine J.
              Ramos-Gonzalez, Isabel
      8
              Ramos, Juan
              Sariaslani, Sima
      9
     11 <120> TITLE OF INVENTION: Method for the Production of p-Hydroxybenzoate in Species of
     12
             Pseudomonas and Agrobacterium
     14 <130> FILE REFERENCE: BC1018 US CIP
C--> 16 <140> CURRENT APPLICATION NUMBER: US/09/997,664
C--> 17 <141> CURRENT FILING DATE: 2001-11-28
     19 <150> PRIOR APPLICATION NUMBER: 09/585,174
     20 <151> PRIOR FILING DATE: 2000-06-01
     22 <160> NUMBER OF SEQ ID NOS: 112
     24 <170> SOFTWARE: Microsoft Office 97
     26 <210> SEQ ID NO: 1
     27 <211> LENGTH: 6491
     28 <212> TYPE: DNA
     29 <213> ORGANISM: Pseudomonas mendocina KR-1
     31 <400> SEQUENCE: 1
     32 teactecece ttgageeggt agetgatetg egegegaete atgeceaaea tetgegeege
     33 cgcggtgagg ttgccgccgg tgcgttccag ggcaaggtgc accaggcgct gctcgatctc 120
     34 cttcagtgat gtgcctagta cccggtcgcg cccggcgagg aaggcctgca ggttggccag 180
     35 coccagetca aceggtteat getectegae aaceaeetca geeegegett geggttegee
     36 geogaeggea tecagaegge etteggeggt eaggeegatg eegetggage gaagtggete 300
     37 gccggctttt gccaggtgca ccaggtcgat cagctcgcca ctgcctgcgg cgatcacgcc 360
     38 gcgctcgatc aggttctgca gctcacggat attgccgggg aagcggtagg tcagcagcgc 420
     39 gttgaccagc cgcgtgctga aacccagggg tttgagccca tggcgcgcac tgaacttgcg 480
     40 caggaagtag ctcatcagga gcgggatgtc ctcacggcgc tcgcgcaggg gcggcagatg
     41 gatggggaac acgttcagcc ggtacagcag gtcctcgcgg aagcgcccgg cctcgacctc
                                                                           600
                                                                           660
     42 teggegeagg tecagattgg tggeggegat caeceteaca tecaceggga tegeegaggt
    43 accacctace egetequatet egeceteetq caqeaceege aggatettge tetqqqeget
                                                                           720
    44 gaggeteagg gtggegatet egtegaggaa eagggtgeeg eeettggeee getegaageg
    45 ccccqqqcqq qaacqqtcqq cqccqqtqaa qqcaccqcgc tccacgccqa acaqttcqqc
    46 ttccagcaga gtttccggca acgccqcqca qttqagcgcc accaacggcq tttqgcggcg
    47 cgggctggcc tggtgcaggg tgcgcgcgaa gagctccttg cccacccccg attcaccggt 960
    48 cagcagtacg gtggcctggg tcgacgcaac gcggtagagc tgctggctgg cggcgacaaa 1020
    49 ggcggcggaa atgcccacca tggcctggtc ctcgggcggc tcatccagat cggccatttc 1080
    50 cgtctcgtct gccqagccgt aggtgctccg gctqaggaag tcgctggcat ccaggtgggc 1140
    51 caggteggtg tegatgteet eccaetgete egeeggettg eegaegatge ggeaegeega 1200
    52 atggcccatg cagcggcatt cctgctcgcg gaacaccacc aggcgcccca gcagggagga 1260
    53 ggtgtagccg ctggcgtagc ccacttccat ccagcaggcc ggttcgctgc ccagcccgta 1320
    54 gctggcgatg tgctcgtcgg cttccaggga gttgtgccag aagaattcgg aatagaaatg 1380
    55 cccgatgctg gagtcgatgt cgaagcgcac cacttccacg ttcaccatgc cctccagcat 1440
    56 gtgcaggcgc gggcctgcgc tgtagaggct ggcgtggtcg ccctcgggcc actgcgcgct 1500
    57 gacctgageg geateceteg tteeggeetg ceagecaatg egggteagaa ggeeaeggge 1560
```

RAW SEQUENCE LISTING DATE: 12/07/2001 PATENT APPLICATION: US/09/997,664 TIME: 13:03:07

Input Set : A:\BC1018 US CIP Seq Listing.txt
Output Set: N:\CRF3\12072001\1997664.raw

58 cttgtcgagg ccqagggctt ccaccaactc gcgacggatg gcgccgaagg cggcccctg 1620 59 cagcagcatc atgcgctggc cgcagagcca gatattgcca tcctggggcg cgaaggcgac 1680 60 ggtctccgcc agttgctcgg ccgagggcag cccgctgctg ccgaactggt tggcctggtc 1740 61 gacgatcagg ctcttctgcc ggccgagcaa ctgcttgagg aattcatccc ccatgctgcg 1800 62 gccgggattg ctcgagggtt tgcgagtcat ggtcatgggg cgggaggtag gaacaatgtt 1860 63 attcagtatg cccgtgtgaa atggccggtc aattggccct tgccatcacc caataatcgc 1920 64 ccaacctctt gcagaccact ccggagaagt ttctgcgccc cggagacttc tctgaagaaa 1980 65 aateggegee aacceteeeg caageeeece atgegteege teegeattee ecaaaaaaaa 2040 66 gtaaccaatt gttttacaaa taaaaaatag aagaaagaag gattggcacg gtagttgtta 2100 67 aaggacaggg gegtgeacee aagacaataa caacacaggt aacgaceeta tgaacegett 2160 68 cccategeca atecatteeg ettgeceaec egeaecaegg ettegttgtt gaeceteaae 2220 69 cqtacctcca caggaacqqc qcccqcqcqt cttqcctqac qtatcqccac gcgcccqtqt 2280 70 aaccaccggc tcqccqccac tqqcaqcctt ccqcqcaaac aaqaqaqaac ccatqqacac 2340 71 caccequect gectaccaga acctegaget ccaacetete geogggeaat ggegeegg 2400 72 cagtageggt egecegttgg aggtettega eccetacaac gaegagetge tattgegeat 2460 73 egecetggee ageegegaag acetegaege ageetaeege aaggeeegeg acageeageg 2520 74 ggagtgggcg accacggcgc cggccgagcg cgcccgggtg ctgctggaag cggtgaagat 2580 75 cttcgatgag cgccgcgagg agattatcga ctggatcatc cgcgagtccg gcagcacccg 2640 76 catcaaggeg cagategaat ggggegeege eegegeeate accetggagt eggeeageet 2700 77 geogaatege gtgeaeggge geateatege etecaacate teeggeaagg agageegegt 2760 78 gtaccgcgcg cccctgggcg tgatcggcgt gatcagtccg tggaacttcc ccctgcacct 2820 79 cactgocogo tecetggeec eggeeetgge eetgggeaat geegtggtgg teaageegge 2880 80 cagcgacacc ccgatcaccg gtggcctact gctggcgcgc atcttcgaag aagccggcct 2940 81 gccggcgggc gtgctcagcg tggtggtggg ttcgggcgcg gagattggtg acgccttcgt 3000 82 cgagcacccg gtqcccqccc tcatttcctt caccggctcc actcaggtgg gccgcaacat 3060 83 cqqccqcatc gccaqcqqcq qtqaqcacct caaqcacqtq qcqctqqaac tgggcggcaa 3120 84 caqcccqttt gtqqtcttqq ccqatqccqa cqtqqaqcaq qcqqtqaatq cqqccqtqqt 3180 85 cqqcaaqttc ctqcaccaqq qccaqatctq catqqcqatc aaccqcatta tcqtcqaqca 3240 86 gcctttgctg gaagatttca cccgccgctt cgtcgagcgc gtcaaggccc tgccctatgg 3300 87 cgacccgage aagccgggga ccgtggtcgg tccggtgatc aacgccaggc agctggccgg 3360 88 tetgaaggag aagategeea eegeeaagge egaaggegee accetgetge tgggtggega 3420 89 gccccagggc aacgtcatgc cgccccatgt gttcggcaac gtcaccgccg acatggaaat 3480 90 cyccogcyaa qaaattttcy ycccyctyyt gyycatccaa tccycccyty acyccyaaca 3540 91 cgccctqqaq ttqqccaaca qcaqcqaqta cqqcctqtcc aqcqcqqtqt tcaccqccaq 3600 92 cctcgagcgc ggcgtgcagt tcgcccggcg catccacgcc ggcatgaccc acgtgaacga 3660 93 catcccggtt aacgacgage ccaacgetee etteggegge gagaagaaet etggeetegg 3720 94 ccgcttcaac ggcgactggg ccatcgagga gttcaccacc gatcactgga tcaccctgca 3780 95 acacagocog oggocotato ogttotgatg otgococato occatoacco agococaata 3840 96 aaaaacggag tacgaaatgt cctcactcct caacagccga gctgtgaaac ggccactgct 3900 97 ggccagcctt gcactaattt tegeeetget egeeggeeag geettegeeg aeggegaegg 3960 98 cgtctggaaa ggcggcgaga acgtctacca gaaaatctgt ggccactgcc acgaaaaaca 4020 99 ggtgggcccg gtgatcaccg gccgccagct accgccgcag tacatcagtg ccgtggtgcg 4080 100 caacggcttc cgcgccatgc cggcctttcc ggcctcgttc atcgacgaca aggccctgca 4140 101 gcaggtcgcc gagtacatct ccaagacccc tgctactgtg gccaagccct gaggtgccgg 4200 102 cgatgaacat cgaacgtcgt accetgctca agggcatggc cctgggcggc ctggctggcg 4260 103 ccgccatggg cgccttcggc ctggcgatga ccaaggccat gctgggcggg caggcccagc 4320 104 cactgcccac cctcgtcctg gtagatggcg aggcggccgg agcggccttc ctcgccggag 4380 105 tegattecay eccygeagee ageaaggeeg aggtgeageg cacegatete ggeetggact 4440 106 tcgtcttggg cctggagaag cgcctgcgca gtggtcagca gcaacgcatc atcggtctgg 4500 RAW SEQUENCE LISTING DATE: 12/07/2001 PATENT APPLICATION: US/09/997,664 TIME: 13:03:07

Input Set : A:\BC1018 US CIP Seq Listing.txt
Output Set: N:\CRF3\12072001\I997664.raw

107 tggatgacgc cagcgccgct ctgatcctcg acctggcccg cagcagcggc gcgcgggtgc 4560 108 agtggctcgg ccagcatagc gccgcggccg gctcctcccg gcaccgtctg ctcagcgccg 4620 109 acagegeeca gggetgetee ettegeetgg geeageaget ceatgeetge ggeggegget 4680 110 tcagcctgag cgaacagcac cccctgggtg gccagcccct gaatctggcc ggtgccgcgc 4740 111 gcagcggcgg ctccgcgcaa tgggcggcca gcatcggcca cgacctggcc agcctgggcg 4800 112 gcgatgacag cagtgcggcc ccacgcattg ccaaccatta cccggcgctt accggccaat 4860 113 tcgtttcgtt ctcgatcctg gtttgaagga gctgacagat gaccgagcaa acccagaaca 4920 114 ccctqattcc ccqtggcgtg aatgacgcca acctccagca agccctggcc aagttccgca 4980 115 agetgetggg egaggacaac gteetggtea aggacgagea acteateece tacaacaaga 5040 116 tcatgatege agtggacaac geegaacaeg egeecteege tgetgtcace geeaceaetg 5100 117 tggaacaggt gcagggcgtg gtgaagatct gcaacgaata cggcattccg gtgtggacca 5160 118 tetecacegg ceqeaactte ggttacgget eggeggeece eggecagegt ggecaggtga 5220 119 tectegacet gaagaaaatg aacaagatea tecaegtaga eeeggacetg tgeaeegeee 5280 120 tgqtgqaacc gggggtqacc taccagcagc tgtacqatta cctgqaaqag aacaacatcc 5340 121 cgctgatgct gtccttctct gcaccctcgg ccatcgccgg cccgctgggc aacaccatgg 5400 122 acceptagegt gagetacace ecctaeggeg ageaetteet catgeagtge gageatggaag 5460 123 tggtgctggc caatggcgac gtctaccgca ccggcatggg cggggtgaaa ggcgacaacg 5520 124 cetggeaggt gttcaagtgg ggctacggcc cgaccetgga cggcatgttc acceaggcca 5580 125 actacggcat ctgcaccaag atgggtttct ggctgatgcc caagcccccg gtgttcaagc 5640 126 cettegagat caagttegag aacgagteeg acateagega gategtegaa tteateegte 5700 127 cgctgcgcat cgcccaggtc atcccaaact ccgtggtgat cgccggtgtg ctctgggagg 5760 128 cetecacety caataceege egeteggaet acaceaetya geegggegee acteeegaea 5820 129 ccatcctgaa gcagatccag aaggacaagg aactcggcgc ctggaacgtc tatgccgctc 5880 130 tetacggeac geaggaacag gtggaegtga actggaagat egteacegge geeetggeea 5940 131 aactgggcaa gggcaggatt gtcacccagg aagaggccgg cgatacccag cccttcaagt 6000 132 acceptacca gttgatgtcc ggcgtcccca acctgcagga attcggcctg tacaactggc 6060 133 geggggggg eggetecatg tggttegeec eggteageea ggeeegtgge ategagtgeg 6120 134 acaaqcaqca qqcqctqqcc aaqaaqatcc tcaacaaqca cqqcctgqac tacqtcqqcq 6180 135 agttcattqt cqqctqqcqc qacatqcacc acqtaatcqa cqtqctqtac qaccqcacca 6240 136 accccgagga aacccaacgc gcctacgcct gcttccacga gttgctggat gagttcgaga 6300 137 agcacggcta tgcggtgtac cgcgtgaaca ctgcgttcca ggagcgcgtg gcgcagaggt 6360 138 acggcacggt caagcgcagg tggaacacgc catcaagcgc gccctggacc cgaacaacat 6420 139 cctggcaccc ggcaaatccg gcatcgacct cgccaacaag ttctaaccct aagcaagacc 6480 140 ccgccgggta a 142 <210> SEQ ID NO: 2 143 <211> LENGTH: 611 144 <212> TYPE: PRT 145 <213> ORGANISM: Pseudomonas mendocina KR-1 147 <400> SEQUENCE: 2 148 Met Thr Met Thr Arg Lys Pro Ser Ser Asn Pro Gly Arg Ser Met Gly 149 5 10 151 Asp Glu Phe Leu Lys Gln Leu Leu Gly Arg Gln Lys Ser Leu Ile Val 152 20 154 Asp Gln Ala Asn Gln Phe Gly Ser Ser Gly Leu Pro Ser Ala Glu Gln 155 35 40 157 Leu Ala Glu Thr Val Ala Phe Ala Pro Gln Asp Gly Asn Ile Trp Leu 55 160 Cys Gly Gln Arg Met Met Leu Leu Gln Gly Ala Ala Phe Gly Ala Ile 161 65 70 75

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/997,664

DATE: 12/07/2001
TIME: 13:03:07

Input Set : A:\BC1018 US CIP Seq Listing.txt
Output Set: N:\CRF3\12072001\I997664.raw

163 164	Arg	Arg	Glu	Leu	Val 85	Glu	Ala	Leu	Gly	Leu 90	Asp	Lys	Ala	Arg	Gly 95	Leu
166 167	Leu	Thr	Arg	Ile 100	Gly	Trp	Gln	Ala	Gly 105	Thr	Arg	Asp	Ala	Ala 110	Gln	Val
	Ser	Ala	Gln 115		Pro	Glu	Gly	Asp 120		Ala	Ser	Leu	Tyr 125		Ala	Gly
	Pro	Arg 130		His	Met	Leu	Glu 135		Met	Val	Asn	Val 140		Val	Val	Arg
175			Ile	Asp	Ser			Gly	His	Phe	_		Glu	Phe	Phe	_
178	145 His	Asn	Ser	Leu		150 Ala	Asp	Glu	His		155 Ala	Ser	Tyr	Gly	Leu	160 Gly
179 181	Ser	Glu	Pro	Ala	165 Cys	Trp	Met	Glu	Val	170 Gly	Tyr	Ala	Ser	Gly	175 Tyr	Thr
182				180					185					190		
185			195		_			200			_		205		Cys	
187 188	Cys	Met 210	Gly	His	Ser	Ala	Cys 215	Arg	Ile	Val	Gly	Lys 220	Pro	Ala	Glu	Gln
	_	Glu	Asp	Ile	Asp		Asp	Leu	Ala	His		Asp	Ala	Ser	Asp	
	225	a	3	a	m1	230	01	G	21.	3	235	m1	G1	1/	31.	240
194			_		245	_	_			250					Ala 255	
196 197	Leu	Asp	Glu	Pro 260	Pro	Glu	Asp	Gln	Ala 265	Met	Val	Gly	Ile	Ser 270	Ala	Ala
199 200	Phe	Val	Ala 275	Ala	Ser	Gln	Gln	Leu 280	Tyr	Arg	Val	Ala	Ser 285	Thr	Gln	Ala
202 203	Thr	Val 290	Leu	Leu	Thr	Gly	Glu 295	Ser	Gly	Val	Gly	Lys 300	Glu	Leu	Phe	Ala
	Arg		Leu	His	Gln	Ala		Pro	Arg	Arg	Gln		Pro	Leu	Val	Ala
	305					310					315					320
208 209	Leu	Asn	Cys	Ala	Ala 325	Leu	Pro	Glu	Thr	Leu 330	Leu	Glu	Ala	Glu	Leu 335	Phe
	Glv	Val	Glu	Ara		Ala	Phe	Thr	Glv		Asp	Ara	Ser	Ara	Pro	Glv
212	1			340	1				345			5		350		1
	Arg	Phe		Arg	Ala	Lys	Gly	_	Thr	Leu	Phe	Leu	_	Glu	Ile	Ala
215	mhm	T	355	T 0	Com	71.	C1	360	T	T1.	T 0	7	365	T a	Gln	C1
217	THE	370	ser	Leu	ser	Ата	375	ser	гуѕ	ire	Leu	380	٧a٠	Leu	GIN	GIU
	Gly		Ile	Glu	Arg	Val		Gly	Thr	Ser	Ala		Pro	Val	Asp	Val
	385				_	390		-			395		•		-	400
	Arg	Val	Ile	Ala	Ala	Thr	Asn	Leu	Asp		Arg	Arg	Glu	Val	Glu	Ala
224					405					410					415	
226	GIY	Arg	Phe	Arg 420	GIu	Asp	Leu	Leu	Tyr 425	Arg	Leu	Asn	Val	Phe 430	Pro	IIe
	His	T.eu	Pro		T.en	Ara	Glu	Δra		Glu	Asn	Tle	Pro		Leu	Met
230	****	Lu	435	110	Lou	9	Jiu	440	****9	Jiu	712P	110	445	Lou	LCu	-100
	Ser	Tyr		Leu	Arg	Lys	Phe	Ser	Ala	Arg	His	Gly	Leu	Lys	Pro	Leu
233		450					455					460				
235	Gly	Phe	Ser	Thr	Arg	Leu	Val	Asn	Ala	Leu	Leu	Thr	Tyr	Arg	Phe	Pro

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/997,664

DATE: 12/07/2001
TIME: 13:03:07

Input Set : A:\BC1018 US CIP Seq Listing.txt
Output Set: N:\CRF3\12072001\I997664.raw

226	465					470					475					480
		7 ~~	T]_	7	C1		Cln	7 an	т	т1а		7 ~~~	C1	370.1	т1.	
	GIY	ASII	шe	Arg	485	Leu	GIII	ASII	Leu		GIU	Arg	GIY	Val		Ald
239		a 1	_	~1			#1 -		_	490	TT !				495	~ 1
	АТа	GIY	Ser	_	GIU	Leu	ше	Asp		vaı	HIS	Leu	Ата	Lys	Ата	GIY
242				500			_		505			_	_	510		
	Glu	Pro		Arg	ser	Ser	GLY		GTA	Leu	Thr	Ala		Gly	Arg	Leu
245			515					520					525			
247	Asp	Ala	Val	Gly	Gly	Glu	Pro	Gln	Ala	Arg	Ala	Glu	Val	Val	Val	Glu
248		530					535					540				
250	Glu	His	Glu	Pro	Val	Glu	Leu	Gly	Leu	Ala	Asn	Leu	Gln	Ala	Phe	Leu
251	545					550					555					560
253	Ala	Gly	Arg	Asp	Arg	Val	Leu	Gly	Thr	Ser	Leu	Lys	Glu	Ile	Glu	Gln
254					565					570					575	
256	Arg	Leu	Val	His	Leu	Ala	Leu	Glu	Arg	Thr	Gly	Gly	Asn	Leu	Thr	Ala
257				580					585					590		
259	Ala	Ala	Gln	Met	Leu	Gly	Met	Ser	Arq	Ala	Gln	Ile	Ser	Tyr	Arq	Leu
260			595			•		600	_				605	-	•	
	Lvs	Glv	Glu.													
263	_	610														
	<210> SEO ID NO: 3															
			-	H: 49												
			YPE:		-											
					Pseu	1doma	ากลต	man/	locir	na KI	2 - 1					
				NCE:		raomi	Juas	men	10011	iu Ni						
			_			Dro	λla	Фттх	Cln	λαn	T 011	clu	LOU	Gln	Dro	T 011
271	Met 1	wsb	1 1111	1111	A19 5	PIO	мта	тут	GIII	10	ьец	GIU	ьeu	GIII	15	Leu
		C1**	Cln	m xx	_	ת 1 ת	C1**	Cor	Cor		λ ~ α	Dro	Tou	Glu		Dho
	нта	СТУ	GIII	_	ALG	нта	сту	Ser		СТУ	AIG	PIO	Leu		Val	Pile
275	3	D	m	20	7	a 1	T	T	25	7	T1_	71.	T	30	a	3
	ASP	Pro	_	ASII	ASP	GIU	ьeu		Leu	Arg	ше	Ald		Ala	ser	Arg
278	a 1	•	35					40	.			•	45	a 1		a 1
	GIU		ьeu	Asp	Ата	Ата	_	Arg	ьуs	Ата	Arg		ser	Gln	Arg	GIU
281	_	50		_,		_	55				_	60	_	_		
	_	Ala	Thr	Thr	Ala		Ala	Glu	Arg	Ala	_	Val	Leu	Leu	GIu	
284	65		_	_		70			_	_	75	_			_	80
	Val	Lys	Ile	Phe	_	Glu	Arg	Arg	Glu		Ile	Ile	Asp	${\tt Trp}$		Ile
287					85					90					95	
	Arg	Glu	Ser	Gly	Ser	Thr	Arg	Ile	_	Ala	Gln	Ile	Glu	${\tt Trp}$	Gly	Ala
290				100					105					110		
292	Ala	Arg	Ala	Ile	Thr	Leu	Glu	Ser	Ala	Ser	Leu	Pro	Asn	Arg	Val	His
293			115					120					125			
295	Gly	Arg	Ile	Ile	Ala	Ser	Asn	Ile	Ser	Gly	Lys	Glu	ser	Arg	Val	Tyr
296		130					135					140				
298	Arg	Ala	Pro	Leu	Gly	Val	Ile	Gly	Val	Ile	Ser	Pro	Trp	Asn	Phe	Pro
	145					150		_			155					160
301	Leu	His	Leu	Thr	Ala	Arg	Ser	Leu	Ala	Pro	Ala	Leu	Ala	Leu	Gly	Asn
302					165	-				170					175	
	Ala	Val	Val	Val		Pro	Ala	Ser	Asp		Pro	Ile	Thr	Gly	Gly	Leu
305				180	-				185					190	-	
	T	Τ.Δ11	Δla	Ara	Ile	Phe	Glu	Glu	Ala	Gly	Leu	Pro	Ala	Glv	Val	Leu
30/	ьeu	пcu														

VERIFICATION SUMMARY

A

DATE: 12/07/2001

PATENT APPLICATION: US/09/997,664

TIME: 13:03:08

Input Set : A:\BC1018 US CIP Seq Listing.txt
Output Set: N:\CRF3\12072001\I997664.raw

L:16 M:270 C: Current Application Number differs, Replaced Application Number

L:17 M:271 C: Current Filing Date differs, Replaced Current Filing Date